ABSTRACT

The present invention includes the preparation of highly conducting conjugated polymers and their use as electrochemical actuators. A typical electrochemical actuator comprises a highly conducting, conjugated polymer for the anode or the cathode, or for both the anode and the cathode; suitable conjugate polymers have a conductivity $\geq$ 100 S/cm. The material may have any form, including films and fibers. A preferred shape is a strip or a fiber, where the fiber can be solid or hollow, although any shape may be used. Before use, the material may be treated, for example, by immersion in an acid, in order to dope/protonate the material or to introduce anions or to exchange the anion in the polymer for another anion. Other materials may be incorporated in the polyaniline to increase its conductivity or to provide other benefits, such as increased strength. Useful conducting polymers include monomers of anilines, pyrroles, thiophenes, phenylene vinylenes, and derivatives thereof.